

Claims

1 1. A method of determining patient compliance, comprising
2 sub 3a17 providing a medication with a detectable marker to be taken by the patient, and
3 subsequently analyzing the patient's breath to confirm the presence of said marker and
4 thus the taking of said medication.

1 2. The method of claim 1 wherein the medication itself comprises said detectable
2 marker.

1 3. The method of claim 1 wherein the marker is an odorous substance.

1 4. The method of claim 3 wherein the patient's breath is analyzed to confirm the
2 presence of said marker by sensor technology selected from semiconductor gas sensor
3 technology, conductive polymer gas sensor technology, or surface acoustic wave gas sensor
4 technology.

1 5. The method of claim 4 wherein the sensor technology produces a unique electronic
2 fingerprint to characterize the marker such that the presence and concentration of the marker is
3 determined.

1 6. The method of claim 1 wherein the marker is a flavor ingredient selected from trans-
2 Anethole (1-methoxy-4-propenyl benzene) - anise; Benzaldehyde (benzoic aldehyde) - bitter
3 almond; Butyl isobutyrate (n-butyl 2, methyl propanoate) - pineapple; Cinnamaldehyde (3-
4 phenylpropenal) - cinnamon; Citral (2-trans-3, 7-dimethyl-2, 6-octadiene-1-al) - citrus;
5 Menthol (1-methyl-4-isopropylcyclohexane-3-ol) - menthol; and alpha-Pinene (2, 6, 6-
6 trimethylbicyclo-(3,1,1)-2-heptene) - pine.

1 7. The method of claim 1 wherein the patient's breath is analyzed to confirm the
2 presence of said marker by a spectrophotometer.

1 8. The method of claim 1 wherein the patient's breath is analyzed to confirm the
2 presence of said marker by a mass spectrometer.

1 9. The method of claim 1 wherein the marker is an additive combined with the
2 medication.

1 10. The method of claim 1 wherein the marker is a coating on the medication.

1 11. The method of claim 10 wherein a substance to stimulate salivation is included with
2 the marker.

1 12. The method of claim 1 wherein the marker is included with a liquid medication.

1 13. The method of claim 1 wherein the marker is included with a pulmonary delivered
2 medication.

1 14. The method of claim 1 wherein the marker is included with an intranasal delivered
2 medication.

1 15. The method of claim 1 wherein the marker is included with intravenously delivered
2 medication.

1 16. The method of claim 1 further comprising the step of recording data resulting from
2 analysis of the patient's breath.

1 17. The method of claim 1 further comprising the step of transmitting data resulting
2 from analysis of the patient's breath.

1 18. The method of claim 1 wherein the analysis of the patient's breath includes
2 comparing the marker sensed in the patient's breath with a predetermined signature profile of
3 a specific marker.

1 19. The method of claim 18 wherein the predetermined signature profile of a specific
2 marker is associated with a specific drug.

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1 20. The method of claim 18 wherein the predetermined signature profile of a specific
2 marker is associated with a class of drugs.

1 21. The method of claim 1 further comprising the step of capturing the patient's breath
2 in a vessel prior to analysis.

1 22. The method of claim 1 further comprising the step of dehumidifying the patient's
2 breath prior to analysis.

1 23. The method of claim 1 wherein the marker first reacts with enzymes in the patient's
2 mouth to be detectable.

1 24. The method of claim 1 wherein the marker first reacts with acids in the patient's
2 stomach to be detectable.

1 25. The method of claim 1 wherein the marker is absorbed in the patient's
2 gastrointestinal tract and excreted in the lungs.

1 26. The method of claim 1 wherein the data resulting from analysis of the patient's
2 breath includes marker concentration and, thus, medication concentration.

1 27. The method of claim 1 further comprising the step of identifying a baseline marker
2 spectrum for the patient prior to the patient's taking of the medication.

1 28. The method of claim 1 wherein said analysis further includes detecting exhalation
2 of the patient's breath with a sensor.

1 29. A method of determining patient compliance, comprising
2 providing a medication with a detectable marker to be taken by the patient, and
3 subsequently analyzing the patient utilizing transdermal detection to confirm the
4 presence of said marker and thus the taking of said medication.

1 30. A method of determining patient compliance, comprising
2 providing a medication with a detectable marker to be taken by the patient, and

3 subsequently analyzing the patient utilizing reverse iontophoresis detection to confirm
4 the presence of said marker and thus the taking of said medication.

1 31. A method of producing medication which is detectable for patient compliance,
2 comprising
3 identifying a detectable marker substance, and
4 producing a medication combined with said detectable marker substance to be taken by
5 the patient whereby subsequent analysis of the patient's breath will confirm the presence of said
6 marker substance and thus the taking of said medication.

1 32. An apparatus for rapidly determining patient compliance with medications, said
2 medications having marker substances associated therewith, comprising

3 (a) a sensor having a surface exposed to the patient's breath and comprising a material
4 selectively absorptive of a group of chemical substances of which said marker substance is a
5 member;

6 (b) analysis means, coupled to the sensor, for producing an electrical signal indicative
7 of the presence of said marker substance.

1 33. The apparatus of claim 32, wherein the analysis means are further operative to
2 determine the approximate concentration of the marker substance.

3
4 34. The apparatus of claim 33, wherein the sensor comprises a surface acoustic wave
5 device.

1 35. An apparatus for rapidly determining patient compliance with medications, said
2 medications having marker substances associated therewith comprising:

3 (a) means for receiving air exhaled by the patient; and

(b) means for measuring the marker substance concentration in said exhaled air.

1 36. The apparatus of claim 35 wherein said means for measuring the marker substance
2 comprises sensor technology selected from semiconductor gas sensor technology, conductive
3 polymer gas sensor technology, or surface acoustic wave gas sensor technology.

38. A method of detecting medication in a patient comprising:
analysing the patient's breath to detect the presence of a predetermined marker; and
identifying the medication in the patient which is associated with the detected marker.